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TO: All Waste and Hazardous Materials Division Staff

FROM: George W. Bruchmann, Chief, Waste and Hazardous Materials Division

SUBJECT: Volatile Organic Compound (VOC) Sediment Sampling Method 5035 Field Sampling Procedure

The following is the updated Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division (WHMD), soil/sediment sampling procedure to be used for the United States Environmental Protection Agency's (U.S. EPA's) SW-846, Method 5035. Facilities within the treatment, storage, and disposal facility universe of the Hazardous Waste Program have been previously notified regarding implementation of sampling and laboratory procedures for Method 5035. Training regarding the collection of soil VOCs has been initiated by the MDEQ, Remediation and Redevelopment Division, at several district and Lansing locations. Staff who still needs to be trained should contact other field sampling staff who have been trained or John McCabe, WHMD, for a demonstration of the new field procedure.

Plastic syringes with caps, 40-ml volatile organic analytes (VOA) vials, teflon methanol pouches, and green CH_3OH (methanol) labels will be available from Barry Baker, Laboratory Services Section, Environmental Science and Services Division (ESSD), MDEQ, at the Terminal Road facility. Mr. McCabe will be responsible for the ordering and distribution of the other supplies (i.e., weights, scales, cutting tools, and clips) needed for the field procedure. Extra supplies will also be kept at the Filley Street facility in the WHMD storage area. Contact Mr. McCabe if the supplies are running low. The jar "weights" are recorded on a label using methanol semiresistant ink. Please do not add any other labels (exception is the green hazardous label for the methanol/soil sample jar), tape, etc. Please make sure you remove excess soil from the exterior of the jar and lid threads, otherwise, you will affect the weight and seal of the jar. The MDEQ Laboratory MUST receive the sample within four days of collection. Total holding time for the sample is 14 days.

This procedure is intended to diminish the volatilization of contaminants, so the less disturbance to the soil matrix and more quickly the sample from the ground is placed in methanol, the more accurate the analytical results will be. Therefore, the sample should be prepared and the procedure followed as quickly as safety and accuracy allow.

EQUIPMENT REQUIREMENTS

- Methanol 10-ml pouches
- Plastic 10-ml syringes with caps
- 10 Gram weight
- Scale (spring loaded or electronic)
- Steel-toed boots
- Decontamination material
- 40-ml glass VOA vials (labeled)
- Scissors or other cutting tool
- Safety goggles
- Gloves
- Hard hat

I. TRIP BLANK

1. Wear your safety goggles and appropriate gloves.

2. Pour methanol from a pouch into an empty 40-ml vial at the beginning of the sampling event. This will serve as a trip blank to check on cross contamination of methanol preserved samples.

3. Label the trip blank.

4. The pure methanol sample (trip blank) must accompany each batch of samples (each cooler) for each site and each day that samples are collected.

II. FIELD PROCEDURE

1. Wear your safety goggles and appropriate gloves.

2. Decontaminate the field scale and calibrate it with the 10-gram weight provided. Use the scale and weigh an empty syringe. Write the weight of the empty syringe in your field notebook. (If you do not have a 10-gram weight for calibration, you can use an American nickel, which weighs approximately 5 grams. Even though a 5-gram nickel may not provide exact calibration for the soil sample, you should still be able to calibrate your scale with 5 grams and be within the 1 gram +/- tolerance range for the 10-gram soil/sediment sample.)

3. Take the split spoon sample, hand auger sample, or sample from whatever collection device you are using, and insert the open end of the syringe into a fresh face of undisturbed soil (if possible).

4. Push the syringe into the soil and fill it to the point where you believe that you have 10 grams of soil (you may wish to practice filling and weighing the syringe with similar soil from the same sampling location prior to taking your actual sample in order to get an idea of how much soil is required for a 10-gram sample).

5. Using your index finger, thumb, or other instrument, push the soil deeper into the syringe. Note that any material (gloves, instruments, etc.) touching the sample must be decontaminated and clean. Attempt to obtain an area at the opening of the syringe clear of soil. This will assist you in minimizing the amount of contaminants that will adhere to the scale clip.

6. Weigh the soil-filled syringe with the field scale and write the weight in your field notebook.

7. Subtract the weight of the syringe from the total weight of syringe and soil (soil must weigh 10 grams +/- 1 gram tolerance for a 9- to 11-gram range, **WITHOUT** the weight of the syringe). If you do not have 10 +/- 1 grams of soil, you MUST repeat steps 4 through 6, above, until you have a total of 10 +/- 1 grams of soil. For most soils, the same volume of soil will yield approximately the same weight of soil. If you have too much soil, you must discharge soil from the syringe until you fall within the 9- to 11-gram range.

8. Write the soil weight in your field notebook. You do not need to provide the weight of the sample to the MDEQ Laboratory; they will reweigh the sample upon receipt.

9. Remove the cap from the 40-ml vial.

10. Insert the open end of the syringe into the vial, push the plunger, and discharge the soil.

11. Immediately take the methanol pouch and open it by cutting one end off with scissors. You must be wearing your safety goggles at all times.

12. Pour the methanol into the 40-ml vial over the soil.[1] If any methanol is spilled outside of the vial, you MUST discard the sample and take another. Loss of methanol can cause erroneously high results. Care should be taken to ensure that all of the methanol is introduced into the vial.

13. Place cap TIGHTLY on the 40-ml vial and gently shake it for ten seconds.

14. Completely fill out the sample label on the 40-ml vial.

[1]You can opt to place the methanol into the 40-ml vial prior to the soil. There is the possibility of splash, so take precautions when emptying soil into the methanol. All other steps of the soil sampling procedure remain the same.

15. Place the prepared soil sample in an upright position on ice in a cooler. (It is recommended that each sample vial be placed in a zip lock bag in case of leakage.)[2]

16. Use the plastic syringe to collect an additional soil sample from the same source as the first. Fill the syringe approximately 3/4 full. Cap the syringe with the plastic cap and attach a sample identifying label. This sample is for dry weight/total solids analysis.[3] It is very important that the dry weight soil sample come from the same soil type as the methanol sample, i.e., sand to sand/clay to clay, etc.

17. Decontaminate the clip on your scale using standard decontamination procedures. Dispose of all waste materials appropriately.

NOTE: Sediment/high moisture content samples are collected the same as soil samples by following this protocol. You will want to exhibit caution in weighing the sample to prevent spillage of the sample.

NOTE: Labs may use a variety of tracking mechanisms for vial weights (taring), so only use the vials supplied by the lab performing the analysis.

NOTE: If you are collecting samples under a court order, i.e., warrant, it is recommended you take two methanol samples in case of leakage/breakage/incorrect weight <9 or >11 grams.

CAUTION: Methanol is a poison. Handle appropriately. If ingested, contact a physician immediately.

If you have any questions regarding these field procedures and equipment, please contact Mr. McCabe, Laboratory Coordinator, Hazardous Waste Section, WHMD, at 517-335-4789, or e-mail him at mccabej@michigan.gov.

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[2]Please note that any sample collected by following this procedure, which is not sent to a lab, is considered hazardous waste and must be disposed of properly.

[3]The amount of moisture will affect your sample results. The higher the moisture content, the higher the detection limit will be.